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10/665,315	09/18/2003	Yiou-Wen Cheng	250320.1040	5447

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EXAMINER

LAO, LUN S

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2615

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/665,315	<b>Applicant(s)</b> CHENG ET AL.	
	<b>Examiner</b> Lun-See Lao	<b>Art Unit</b> 2615	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 April 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### *Introduction*

1. This action is response to the amendment filed on 04-10-2007. Claims 23-24 have been amended. Claims 1-28 are pending.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4, 6, 8, 13 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "about" in claims 4, 6, 8, 13 and 15 is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 5-18 and 21-28 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 4053711 to DeFreitas et al (hereafter as DeFreitas).

Regarding Claim 1, DeFreitas discloses a multi-channel surround sound expansion method comprising the steps of:

reading a stereo sound signal including a left sound signal and a right sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17);

expanding said stereo sound signal into a Front L channel, a Front R channel, a Front M channel, a Rear L channel and a Rear R channel sound signals (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37);

performing a sound reverberation operation on sound signals of said Front L channel and said Front R channel or said Rear L channel and said Rear R channel to generate sound with echo/reverberation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37);

delaying said Rear L channel and Rear R channel sound signals for a first time value (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37) [Further, the different time delays of 100 ms and 60ms are the full/maximum delays for the rear L and the rear R channels, respectively. However, both channels provide adjustable ranges of delays. By changing the potentiometer 120R, the effective delay of the delay line for the right channel can be varied from 35ms to 100ms. Similarly, the left channel provides a delay varying from 15ms to 60ms. See DeFreitas, col. 7, lines 4-22. Clearly, any value within the common range of delays, ie, from 35ms

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to 60ms would give the rear L and rear R channels the same delay, ie, the same first value.]; and

advancing said Front M channel sound signal for a second time value (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37) [Further, DeFreitas teaches Front M channel by the optional left front channel (fig. 5). Advancing the Front M channel sound signal for a second time value is met by the fact that the optional left front channel combines an undelayed left front channel signal and a delayed signal 142L (fig. 5), which results in a smaller delay, ie, a relative advance of optional left front channel.].

Regarding Claim 2, DeFreitas discloses said step of expanding said stereo sound signal into multi-channel sound signals is accomplished by using a Hafler technique to output said left sound signal directly to said Front L channel, output said right sound signal to said Front R channel, output said left sound signal minus said right sound signal to said Rear L channel, and output said right sound signal minus said left sound signal to said Rear R channel (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Regarding Claim 5, DeFreitas discloses said Front M channel sound signal is a sound signal having high-frequency components filtered out through a low-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 6, DeFreitas discloses the frequency response of said low-pass filtering operation is about -30 dB at 6 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 7, DeFreitas discloses said Rear L channel and Rear R channel sound signals are sound signals having high-frequency components filtered out through a low-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 8, DeFreitas discloses the frequency response of said low-pass filtering operation is about -30 dB at 10 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 9, DeFreitas discloses said step of expanding said stereo sound signal into multi-channel sound signals is accomplished by a Hafler technique to directly output said left sound signal minus said right sound signal to said Front L channel, output said right sound signal minus said left sound signal to said Front R channel, output said left sound signal to said Rear L channel, and output said right sound signal to said Rear R channel (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Regarding Claim 10, DeFreitas discloses said Front L channel and Front R channel sound signals are sound signals having high-frequency components filtered out through a low-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 11, DeFreitas discloses the frequency response of said low-pass filtering operation is about -30 dB at 10 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 12, DeFreitas discloses said Front M channel sound signal is a sound signal whose high-frequency components are filtered out through a low-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 13, DeFreitas discloses the multi-channel surround sound expansion method as claimed in claim 12, wherein the frequency response of said low-pass filtering operation is about -30 dB at 6 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 14, DeFreitas discloses said Rear L channel and Rear R channel sound signals are sound signals having low-frequency components filtered out through a high-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 15, DeFreitas discloses the frequency response of said high-pass filtering operation is about -10 dB at 6 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 16, DeFreitas discloses said multi-channel sound signals further include a super bass channel sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Regarding Claim 17, DeFreitas discloses said super base channel sound signal is obtained by using at least a low-pass filtering operation to filter out high-frequency components of said left sound signal and said right sound channel (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Regarding Claim 18, DeFreitas discloses said Front M channel sound signal is a mean of said left sound signal and said right sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Regarding Claim 21, DeFreitas discloses said multi-channel sound signals further include at least a Middle L channel sound signal and at least a Middle R channel sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Regarding Claim 22, DeFreitas discloses said Middle L channel sound signal is a copy of said Rear L channel sound signal, and said Middle R channel sound signal is a copy of said Rear R channel sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Regarding Claim 23, DeFreitas discloses said first time value is between 10 and 20 ms (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 24, DeFreitas discloses said second time value is between 2 and 4 ms (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).



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Regarding Claim 25, DeFreitas discloses said sound reverberation operation is accomplished through a feedback delay networks technique (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 26, DeFreitas discloses a plurality of delay queues and a queue matrix are provided in said feedback delay networks technique, a channel sound signal is input into said delay queues to generate a plurality of delay signals fed back to said delay queues via said queue matrix, and said channel sound signal is finally added to said channel to form a continually fed-back sound with reverberation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 27, DeFreitas discloses said delay signals generated by said delay queues are obtained by setting a delay constant to said delay queues (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Regarding Claim 28, DeFreitas discloses delay times generated by said delay queues are different from one another (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4053711 to DeFreitas in view of USPN 5,708,719 to Greenberger et al.

Regarding Claim 3, DeFreitas does not expressly disclose said Front L channel and Front R channel sound signals are sound signals having low-frequency components filtered out through a high-pass filtering operation.

However, it is well known in the art to provide a filter which filters out low-frequency components in order to provide a desired frequency response. One of such an example is Greenberger who teaches multi-channel surround sound expansion, wherein the Front L channel and Front R channel sound signals are sound signals having low-frequency components filtered out through a high-pass filtering operation (fig. 1, 218, 220, col. 14, line 37 – col. 15, line 9).

Therefore, it would have been obvious to one having ordinary skill in the art to modify DeFreitas to incorporate a filter which filters out low-frequency components in order to provide a desired frequency response in order to create a realistic sound field (col. 7, lines 13-54).

Regarding Claim 4, DeFreitas as modified does not expressly disclose the frequency response of said high-pass filtering operation is about -10 dB at 6 KHz.

However, where the general conditions of a claim are disclosed in the prior art (here DeFreitas, Greenberger), it is not inventive to discover the optimum or workable ranges by routine experimentation. MPEP 2144.05. Because, among other reasons, there was no evidence of the criticality of the claimed ranges of about -10 dB at 6 KHz, it would have been obvious to one having ordinary skill in the art at the time the invention was

made to modify DeFreitas as modified such that the frequency response of the high-pass filtering operation is about -10 dB at 6 KHz.

8. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4053711 to DeFreitas in view of USPN 5,610,986 to Miles.

Regarding Claim 19, DeFreitas does not expressly disclose the multi-channel sound signals further include a Rear M channel sound signal.

However, it is well known in the art to provide a Rear M channel sound signal in order to an enhance surround sound and more realistic sound. One example is Miles who teaches multi-channel surround sound expansion, wherein multi-channel sound signals further include a Rear M channel sound signal (speaker 6 or 2, fig. 19).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify DeFreitas to incorporate a Rear M channel sound signal in order to provide improved sound imaging and distribution characteristics of the audio system (Miles, col. 3, lines 44-45).

Regarding Claim 20, DeFreitas does not disclose said Rear M channel sound signal is a mean of said Rear L channel and Rear R channel sound signals.

However, it is well known in the art that the mean of said Rear L channel and Rear R channel sound signals is used in order to generated a desired Rear M channel sound signal. One of such an example is found in Miles who teaches multi-channel surround sound expansion, wherein multi-channel sound signals further include a Rear M channel sound signal, wherein the Rear M channel sound signal (center output 38) is a

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mean of said Rear L channel and Rear R channel sound signals (fig. 1, col. 6, line 42 – col. 8, line 9).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify DeFreitas to utilize the mean of said Rear L channel and Rear R channel sound signals in order to provide improved sound imaging and distribution characteristics of the audio system (Miles, col. 3, lines 44-45).

### ***Response to Arguments***

9. Applicant's arguments filed on 04-10-2007 with respect to claims 1-28 have been fully considered but they are not persuasive.

As to applicant's argument regarding the rejections under 112 2<sup>nd</sup> paragraph, applicant's inability to achieve an exact value does not invalidate the rejection.

Applicant argued in substance that (1) DeFreitas does not teach delaying the Rear L channel and Rear R channel sound signals for a first time value because the right rear signal and left rear signal are delayed by two different times (100 ms and 60ms); and (2) DeFreitas does not teach advancing the Front M channel sound signal for a second time value because DeFreitas is silent about the Front M channel sound signal and about advancing a signal for a second time value. (Remarks, page 11).

The examiner respectfully disagrees. As to (1), applicant's characterization of DeFreitas appears incomplete. The different time delays of 100 ms and 60ms are the full/maximum delays for the rear L and the rear R channels, respectively. However, both channels provide adjustable ranges of delays. By changing the potentiometer 120R, the

effective delay of the delay line for the right channel can be varied from 35ms to 100ms. Similarly, the left channel provides a delay varying from 15ms to 60ms. See DeFreitas, col. 7, lines 4-22. Clearly, any value within the common range of delays, ie, from 35ms to 60ms would give the rear L and rear R channels the same delay, ie, the same first value. Thus, DeFreitas meets delaying the Rear L channel and Rear R channel sound signals for a first time value as claimed.

As to (2), DeFreitas teaches Front M channel by the optional left front channel (fig. 5). Advancing the Front M channel sound signal for a second time value is met by the fact that the optional left front channel combines an undelayed left front channel signal and a delayed signal 142L (fig. 5), which results in a smaller delay, ie, a relative advance of optional left front channel. Thus, DeFreitas meets advancing the Front M channel sound signal for a second time value as claimed.

Regarding the arguments with respect to the 103 rejection, the Official Notices are now replaced with teachings of the prior art. Note the 103 rejections above for detailed discussion.

Therefore, applicant's arguments are not persuasive.

### **Conclusion**

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Weingartner (US PAT. 4,594,729) is cited to show other related multi-channel surround sound expansion method.

12. Any response to this action should be mailed to:

Mail Stop \_\_\_\_ (explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents  
P.O. Box 1450  
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Facsimile responses should be faxed to:  
**(571) 273-8300**

Hand-delivered responses should be brought to:  
Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao, Lun-See whose telephone number is (571) 272-7501. The examiner


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can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao, Lun-See 215  
Patent Examiner  
US Patent and Trademark Office  
Knox  
571-272-7501  
Date 06-22-2007

  
VIVIAN CHIN  
SUPERVISOR, PATENT EXAMINER  
TECHNOLOGY CENTER 2600